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ABSTRACT

The faculty training strategy designed by the South Dakota Medical Information Exchange (SDMIX) staff implements principles of innovation and concern theory to facilitate the adoption of teleconferencing as an instructional medium. The goal of the workshop described is to provide faculty with the skills and experiences necessary for developing effective teleconferences. The first phase of the workshop provides participants with information pertaining to the effective design of a teleconference presentation and leads to the development of a 15-minute teleconference program. The second phase, which occurs 3 weeks later, is dedicated to the presentation and critique of the previously-developed teleconference programs from the first phase of the workshop. Results of previous workshop evaluations indicate that providing the participants with these workshop experiences reduced the concerns of faculty regarding teleconferencing. The SDMIX strategy for evaluating the effectiveness of teleconferencing involves collection of data for use in decision-making concerning the continuance, modification, or elimination of teleconferencing activities in South Dakota. This paper includes 15 references. (Author/LMM)

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TRAINING AND EVALUATION STRATEGIES FOR TELECONFERENCING

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Training and evaluation are essential components in the implementation of an innovative telecommunications system. With the advent of an innovation such as telephone teleconferencing, there is generally a period of cautiousness, or a trial stage, until the innovation is adopted. Whether or not an innovation is adopted by the potential users often depends upon the user's needs and the ability of the innovation to meet those needs. (Havelock, 1973; Rogers, 1968). Establishing the relationship between a user's needs and the capabilities of the innovation to meet those needs is a frequent role played by change agents (Havelock, 1973; Rogers, 1972; Rogers and Shoemaker, 1971).

BACKGROUND

The South Dakota Medical Information Exchange (SDMIX) staff has assumed the role of change agents in their efforts to gain acceptance of an innovation, telephone teleconferencing, as an instructional medium within the state of South Dakota. SDMIX staff has effectively addressed the needs and concerns of the teleconference presenters through faculty development workshops and by providing presenters feedback regarding their teleconference presentations. This article describes how princi-

ples of change and concerns theory have been applied in the SDMIX Teach Via Teleconferencing Workshops.

Innovation

Innovation is a powerful and pervasive force in our society today. Rogers and Shoemaker (1971) offered the following definition for the term innovation:

> An innovation is an idea, practice, or object perceived as new by an individual. It matters little, so far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the lapse of time since its first use or discovery. It is the preceived or subjective newness of the idea for the individual that determines his reaction to it. If the idea seems new to the individual, it is an innovation (p.19).

Pincus (1974) adds:

> People associated with education often appear to define as innovation any new policy, process, or organizational change....a technology which improves eductional outcomes, improves working relationships or processes within the educational system....or reduces the costs of education without significantly reducing the quality of desired outcomes or processes. (pp. 115-116)

The statements by Rogers and Shoemaker (1971) and Pincus (1974) accurately describe the situtation South Dakota Medical Information Exchange faces in its efforts to institute instructional teleconferencing. While teleconferencing is not a new instructional medium elsewhere in the nation, it is new to medical education within the state of South Dakota.

User Needs

To bring about the adoption of teleconferencing as a viable instructional tool, South Dakota Medical Information Exchange has proceeded in a systematic manner. The first step was to assess the needs of potential users. Fullan (1972) has stated that in order for change to be effective the user's needs must be addressed. The principle need identified was that School of Medicine faculty wanted a means of providing more continuing medical education programs for South Dakota physicians. Further, the faculty wanted these programs to be delivered cost-effectively throughout the state. This has been a perennial problem because South Dakota is a very large, sparsely populated, state.

Through various techniques including faculty development workshops, South Dakota Medical Information Exchange has attempted to demonstrate how instructional teleconferencing can solve this problem. Eraut (1975) states:

> Unless an educator perceives some discrepancy between his goals and his achievements, he is bound to regard innovation as undesirable and unnecessary; and the extent to which his expressed dissatisfaction is fundamental or trivial will determine the extent to which he is likely to entertain innovation. If an educator does not have a problem, innovation will seem irrelevant. (p. 14)

In accordance with the suggestions of Eraut (1975) SDMIX has instituted faculty development workshops to help bring about the adoption of instructional teleconferencing. During these workshops the SDMIX staff assumes the role of change agents. They act as catalysts, solution givers, process helpers, and resource linkers for faculty members planning to use teleconferencing.

User Concerns

The second step in bringing about the adoption of the innovation was to address the concerns of the faculty regarding the innovation. Once faculty members expressed an interest in participating in a faculty development workshop on teleconferencing, SDMIX staff attempted to assess the individual faculty members level of concern. This was accomplished via questionnaires and interviews. Responses suggested that the primary concerns were two fold: Can teleconferencing be an effective medium to devlier quality instruction? Can presenters unfamiliarity with the technological and programatic aspects of teleconferencing use the medium effectively?

Typically, individuals in the process of change express a variety of concerns which indicate their feeling toward the innovation. According to Hall, (1979), seven levels or stages of concerns are observable during the adoption of any innovative program or project. Each individual involved in an innovation may express concerns which fall within several of the stages, identified by Hall et al.; that is, a profile of several different levels of concerns can be observed for each individual involved in the innovation. Over a period of time, it is expected that the profile will change indicating that the individual has progressed from lower level informational concerns to personal concerns and finally to impact level concerns.

Research by Hall and others lead to the development of the concerns base adoption model. The model can be used to develop research studies which assess the changes in the levels of concerns expressed by individuals as they become more familiar with an innovation. In addition, the model can be used as a guide for a change facilitator attempting to choose appropriate intervention strategies such as faculty development workshops, to hasten the acceptance of an innovation. The importance of

this to change facilitators is that the model provides them a tool which they can use to assess the current level of concerns of individuals involved in the change process and then prescribe experiences which focus on specific concerns. Use of the model in this sense makes it a valuable diagnostic and prescriptive tool in the change process. (Hall & Loucks, 1977, 1978a, 1978b; Hall, Zigarmi, & Hord 1979).

TRAINING STRATEGY

The SDMIX staff developed a faculty development workshop as a means of training faculty members to use teleconferencing effectively. The workshop was designed to address both the needs and concerns of the participants. It was based on a plan derived from the change model of Havelock (1973) and the concerns based adoption model of Hall (1979). The five stage SDMIX workshop plan follows:

1. Determining Presenter Needs and Concerns
2. Creating Awareness and Interest in Teleconferencing
3. Providing Information about Teleconferencing
4. Teaching Teleconferencing Techniques
5. Changing Presenter Attitudes and Behaviors

Determining Presenter Needs and Concerns

As mentioned earlier, SDMIX staff used interviews and questionnaires to assess the needs and concerns of presenters. Again those concerns expressed most frequently related to instructional effectiveness and technical capabilities of teleconferencing. These concerns were manifested in such statements as:

1. It is not as good as face-to-face instructions.
2. People don't understand what is being taught.
3. The equipment might breakdown.
4. I sense a lack of control.
5. How much can I effectively cover during a teleconference.
6. Teleconferencing is not spontaneous.
7. Is my presentation good enough for teleconferencing.

From the above concerns SDMIX developed various presentation segments and learning activities within the workshop to address these concerns.

Creating Awareness and Interest for Teleconferencing

At this stage, the potential user is exposed to the new idea but does not necessarily learn specific information. The presentation is upbeat and positive because the method in which the teleconferencing is presented to the user will affect whether or not he is motivated enough to follow through to the subsequent adoption of the innovation. It is at the awareness stage that the change agent wants to present the innovation in a manner which arouses curiosity. (Havelock, 1973).

Prior to the faculty development workshops, there were several strategies SDMIX used to generate interest in teleconferencing. The SDMIX staff sponsored news conferences, provided press releases, and made presentations to statewide organizations and institutions. SDMIX staff also released pre-workshop publicity which included brochures, newsletters, announcements and word of mouth.

The workshop opens with a multi-media overview of the workshop which delineates the goals of the workshop, highlights each workshop segment, and introduces the SDMIX staff. The multi-media opening was designed to set the mood for the rest of the workshop, interesting, entertaining, and informative. The goal was to create interest and to generate enthusiasm about the workshop.

Providing Information about Teleconferencing

After the workshop opening, a rationale for using teleconferencing is presented. At this time the participants are provided information which demonstrates how teleconferencing can meet their needs. Time and distance barriers and the high cost of travel affecting the delivery of continuing medical education are discussed. In addition to the travel cost issue, the issue of employee productivity is introduced. Participation in continuing medical education programs can be costly for physicians not only in terms of travel cost but also in terms of time away from their practice. It is convincingly demonstrated that teleconferencing is a means of reducing the loss of productive time associated with travel.

Teaching Teleconferencing Techniques

Teaching users appropriate teleconference techniques is essential to the adoption of instructional teleconferencing. Gross et al (1971) suggests that failure to implement an innovation is often attributable to the number of obstacles faced by the user in attempting to carry it

out. One such obstacle is the appropriate use of the innovation. It is at this point in the workshop that guidelines useful in designing teleconferences are presented. Strategies on how to structure teleconferences, to increase participant interaction during teleconferences, and to personalize teleconferences are discussed. Much of the content is presented via teleconference to reduce participant concern over the effectiveness of instructional teleconferencing.

Also during this segment on the proper use of teleconferencing, the selection and utilization of support materials is discussed. Support materials include handouts, slides, films, overheads, and videotapes. The use of support materials adds the visual component which is missing in teleconferencing and helps to gain and maintain attention during the teleconference.

Changing Presenter Attitudes and Behaviors

The resolution of a user's concerns regarding implementation of the innovation often requires a change in user attitude and the development of new skills by the user. If changes in attitudes and skill level are not part of the change process, the user will experience frustration and will reject the innovation (Fullan, 1972). Goodlad and Klein (1974) offer a similar observation:

> Since educators usually are only exposed to ideas, whatever the intended change, and have not yet internalized their full meaning before being on their own with the ideas, it is not surprising that there appears to be a gap between what they think they are doing and what we saw them doing. (p. 103)

In accordance with the suggestions of Fullan, Goodlad and Klien, the SDMIX workshop staff separates workshop participants into small groups and assists them as they design their own fifteen minute teleconference. This segment of the workshop is intended to provide the participants with the skills necessary to develop teleconference presentations and hopefully create a positive attitude toward teleconferencing.

The first step in this process includes: the identification of the content area, the presenter, the intended audience, and the goals and objectives of the presentation. Next the SDMIX staff assists the group in: narrowing the topic to fit a fifteen minute time period, developing a content outline, specifying support materials and planning strategies to encourage participant interaction. The final step is to establish the criteria for evaluation and develop an instrument/procedure to assess whether or not the criteria has been met. In addition to designing a teleconference, participants are given hands on experience in setting up the teleconference equipment, dialing into the SDMIX network, and talking to other locations using the teleconference system. It is anti-

cipated that these experiences will help reduce the concerns of users about teleconferencing and thus increase the probability of adopting this innovation.

The final strategy employed by SDMIX to reduce user concerns is to have the participants present the fifteen minute segment designed during the first day of the workshop via teleconference. Because the participants are encouraged to use support materials, e.g., slides, handouts, videotapes, this segment of the workshop typically takes place three weeks after the first day of the workshop. Each participant must access the SDMIX network from their locations around the state. This segment of the workshop is designed to be as realistic as possible. The workshop participants follow the same protocols they would follow if they were presenting a statewide network program. Each participating location has a moderator who welcomes the other participants, conducts a roll call of all the participating locations, presents an overview of the program, and introduces the instructor. The participants present their topics following the suggestions from the first day of the workshop. When the faculty member has presented his program, the moderator reviews the key points of the program and participants are encouraged to ask questions of the presenter. After each presentation, the SDMIX staff and the other participants provide feedback to the presenter regarding the quality of the program. The feedback session is kept positive and constructive so as not to discourage the presenter from using teleconferencing in the future.

EVALUATION STRATEGY

The purpose of evaluation in the South Dakota Medical Information Exchange is to provide information to presenters, participants and administrators which is useful in making decisions about what progress is being made toward attainment of the network's goals. The proposed evaluation model for the SDMIX project represents an attempt to provide a systematic approach to the identification of evaluative data, data collection, and data analysis procedures which will provide decision-makers with the information necessary to select appropriate alternatives for SDMIX activities. The next three sections present the SDMIX and Area Health Education Centers Program (AHEC) strategy for the evaluation of teleconference presentations. The following major concepts are addressed: decision orientation, presentation technique, and the utility of the content presented.

Decision Orientation

The evaluation strategy for the SDMIX plan is based on the AHEC decision-oriented evaluation strategy. (Witzke, 1979) It assumes that a decision information matrix will be developed which lists the principle decision makers and the principle activities in the evaluation strategy.

The matrix identifies those individuals who are in the decision role and those who are in the advisory role for each individual activity.

The evaluation strategy focuses on activities which, on the basis of evaluation, are to be continued, modified, or eliminated. Decisions concerning continuance, modification, or elimination of an activity or an individual program are not made by the SDMIX staff. The SDMIX staff is in a position only to advise decision makers. The decision makers within the University of South Dakota School of Medicine are the department chairmen, the associate dean for Continuing Medical Education/Graduate Medical Education, or the Dean of the School of Medicine. This evaluation strategy provides decision makers with information relating to an individual presenter's techniques during a teleconference presentation as well as providing information concerning the effectiveness of various teleconferencing techniques employed by other presenters. In addition to the decision-oriented evaluation strategy, research questions have been generated which provide decision makers with other relevant data on which to make decisions. For example, research questions regarding the adoption of change in a health educational delivery system and the effectiveness of various strategies for delivering continuing health education programming via teleconferencing have been investigated.

Presentation Technique

One component of the evaluation of individual teleconference presentations is to focus on an instructor's effective utilization of teleconferencing techniques. Some of the techniques are listed below.

1. Questioning techniques
2. Variety in tonal quality of presenters
3. Pacing
4. Group discussions
5. Audiovisual material utilization
6. Handout utilization
7. Program segmentation
8. Group problem-solving activities
9. Personalizing techniques
10. Participating techniques
11. Feedback techniques
12. Message style techniques

A number of evaluation items on the instrument have been derived from each of the categories listed above. The individual items are described so that they are clearly understood by persons not having experience or background in behavioral sciences or evaluation techniques.

Matrix sampling techniques have been employed to assess participant responses to a wide variety of items which describe the presenter's uti-

lization of teleconferencing techniques. Not every participant would complete the same evaluation instrument; however, the aggregate of all the participants' responses provide a broad-based assessment of presentation techniques.

This evaluation approach is used to provide decision makers with the information relating to both an individual presenter's behaviors during a teleconference presentation and the overall level of performance. The participants rate the individual presenter on items selected from the 12 categories listed above. The overall presentation reflects input received on a variety of items within each response category. Prior to the teleconference, the presenter can decide which items are most applicable to his or her presentation style. These items are weighted to reflect the amount of time and relative importance of the item to the presenter's aggregate presentation.

The procedure used to determine the weighting for the individual activities within the presentation is as follows. The SDMIX staff meets with the presenter to negotiate a list of potential activities to be evaluated. The SDMIX staff provides a listing of techniques typically used in a teleconference presentation. From that list the presenter selects those techniques which most accurately reflect his or her presentation style In this list of techniques, the presenter is asked to identify the least important technique and this technique is given a rating of "one." The presenter is then asked to rate the remaining techniques by indicating how many times more important the other techniques are when compared to the technique rated as "one." These weighting factors are used to compute the aggregate performance rating for the instructor's presentation. The criteria for determination of the adequacy of a presentation is based on positive responses from at least 66 percent of the participants involved in the teleconference presentation.

Utility of Content Presented

After considerable deliberation, it seems apparent that SDMIX was not in a position to evaluate directly the amount of learning that participants acquire as a result of a teleconference presentation. Instead, SDMIX through its evaluation instruments can determine whether participants felt that the seminar met their expectations, the information could be used in their present work situations, and that the information presented was worthwhile.

In order to receive meaningful responses to these three types of questions, it is imperative that content material be developed which is targeted for a specific audience. This implies that the content material is in sufficient depth, at the correct level, and is relevant to the needs of the individual participants.

Because of the capabilities to deliver specialized programming to several small groups of participants at geographically isolated locations, SDMIX has the unique capability to tailor the design, marketing, and delivery of programming relevant to specific needs of participants. This is one of the underlying goals of SDMIX. When a program is designed to meet the needs of a specific target audience, is marketed to attract that specific audience to enroll in the program, and is delivered by a presenter who focuses the content material on direct applications to settings with which the audience is familiar, then SDMIX is in a position to evaluate the effectiveness of the marketing plan for the program as well as for the program itself. The following are representative questions which are asked of participants in teleconference presentations:

Is the content information useful to you in your present position?
Did the course meet your expectations?
Overall, was this a worthwhile experience for you?
Is your present position and job title similar to the job title specified in the target audience description?
Did the seminar contribute to your understanding of the material specified in the seminar's objectives?

Data from these questions allows SDMIX to make judgments concerning the appropriateness of the design and the marketing strategy for a particular teleconference presentation. If an instructor chooses to ask specific content questions of participants, he/she does so with an instrument independent of the teleconference feedback form. Evaluation instruments are designed in such a way that each participant answers from 10 to 20 items.

Based on the data collected from all of the participants in the evaluation process, the decision-makers usually have the information necessary to decide what action can be taken with regard to each element in the educational program as well as the future use of the program itself. As has been stated before, the end point of the evaluation process (which may be the beginning point of further educational development processes) requires that a decision be made to either continue, modify, or terminate the activity. Within the context of the overall project, the redevelopment phases have presumed, in many ways, that the program content area is to be considered as developmental in nature, and that there will be continuing refinement of the program content areas throughout the project based on the decision information collected at each stage. (Witzke, 1979)

The major concepts addressed in the evaluation strategy section were: decision orientation, presentation technique, and the utility of the content presented. The purpose of the SDMIX evaluation strategy is to provide information which is useful in making decisions. This evalu-

ation model involves a systematic approach to the identification of evaluation data, data collection and data analysis procedures for the South Dakota Medical Information Exchange.

SUMMARY

The purpose of this article is to describe how the faculty training strategy designed by the SDMIX staff implements principles of innovation and concern theory to facilitate the adoption of teleconferencing as an instructional medium. The goal of the workshop is to provide faculty with the skills and experiences necessary for developing effective teleconferences. This is accomplished in two phases. The first phase of the workshop provides the participants with information pertaining to the effective design of a teleconference presentation and leads to the development of a fifteen minute teleconference program. The second phase, which occurs three weeks later, is dedicated to the presentation and critique of the teleconference programs which were developed during the first phase of the workshop. Results of previous workshop evaluations indicate that providing the participants with these workshop experiences reduced the concerns faculty held regarding teleconferencing.

The article also descirbes the SDMIX strategy for evaluating the effectiveness of teleconferencing. Evaluation data is collected and used to make decisions concerning the continuance, modification or elimination of teleconferencing activities in South Dakota.

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